Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Spin manipulation in a pulse-pumped double quantum dot with spin-orbit coupling[1] DENIS KHOMITSKY, Department of Physics, University of Nizhny Novgorod, 23 Gagarin Avenue, 603950 Nizhny Novgorod, Russian Federation, EVGENII SHERMAN, Dept. of Physical Chemistry, University of Basque Country, 48080 Bilbao, Spain and IKERBASQUE Basque Foundation for Science, 48011 Bilbao, Bizkaia — Dynamical processes in semiconductor quantum dots are of great interest due to the variety of physical phenomena and possible applications. When the spin-orbit coupling (SOC) is present, even simple systems such as single-electron quantum dots show a rich dynamics in the coupled charge and spin channels. This coupling is in the core of the proposal for a new technique to manipulate the spins in quantum dots by electric field [1,2]. We consider the full dynamics of an electron in a one-dimensional double quantum dot with SOC pumped by an external electric field. Here the tunneling between single quantum dots plays the crucial role in the low-energy states, and both the electron states and the tunneling are spin-dependent. The interplay of the irregular dynamics for spin and charge degrees of freedom is important for the entire system, demonstrating the abilities of a coherent spin manipulation. [1] E. I. Rashba and Al. L. Efros , Phys. Rev. Lett. **91**, 126405 (2003) [2] K.C. Nowack et al., Science **318**, 1430 (2007)

[1]We acknowledge support of the University of Basque Country grant GIU07/40 and from the President of RF Grant MK-1652.2009.2

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Date submitted: 21 Oct 2009 Electronic form version 1.4